

§ 1918.102

(c) Used eye protection shall be cleaned and disinfected before issuance to another employee.

§ 1918.102 Respiratory protection.

(See § 1918.1(b)(8)).

[65 FR 40946, June 30, 2000]

§ 1918.103 Head protection.

(a) The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects.

(b) Such equipment shall comply with American National Standards Institute, ANSI Z-89.1-1986, "Personnel Protection-Protective Headwear for Industrial Workers-Requirements."

(c) Previously worn protective hats shall be cleaned and disinfected before issuance by the employer to another employee.

§ 1918.104 Foot protection.

(a) The employer shall ensure that each affected employee wears protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole.

(b) Such equipment shall comply with American National Standards Institute, ANSI Z-41-1991, "American National Standard for Personal Protection-Protective Footwear."

§ 1918.105 Other protective measures.

(a) *Protective clothing.* (1) The employer shall provide and shall require the wearing of special protective clothing for each employee engaged in work where protective clothing is necessary.

(2) When necessary, protective clothing shall be cleaned and disinfected before reissuance.

(b) *Personal flotation devices (PFDs).* (1) The employer shall provide and shall require the wearing of PFDs for each employee engaged in work in which the employee might fall into the water.

(2) PFDs (life preservers, life jackets, or work vests) worn by each affected employee must be United States Coast Guard (USCG) approved pursuant to 46 CFR part 160 (Type I, II, III, or V PFD)

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and marked for use as a work vest, for commercial use, or for use on vessels.

(3) Personal flotation devices shall be maintained in safe condition and shall be considered unserviceable when damaged in a manner that affects buoyancy or fastening capability.

[62 FR 40202, July 25, 1997, as amended at 65 FR 40946, June 30, 2000]

APPENDIX I TO PART 1918—CARGO GEAR REGISTER AND CERTIFICATES (NON-MANDATORY)

NOTE: This appendix is non-mandatory and provides guidance to part 1918 to assist employers and employees in complying with the requirements of this standard, as well as to provide other helpful information. Nothing in this appendix adds or detracts from any of the requirements of this standard. The language in this appendix is taken directly from the recommended ILO document.

Form No. 1

IDENTITY OF NATIONAL AUTHORITY OR COMPETENT ORGANIZATION REGISTER OF SHIPS' LIFTING APPLIANCES AND CARGO HANDLING GEAR

Name of Ship _____
Official Number _____
Call Sign _____
Port of Registry _____
Name of Owner _____
Register Number _____
Date of Issue _____
Issued by _____
Signature and Stamp _____

NOTE: This register is the standard international form as recommended by the International Labour Office in accordance with the ILO Convention No. 152.

GENERAL

The tests, examinations and inspections indicated in this register are based on the requirements of ILO Convention 152 and Recommendation 160. They are intended to ensure that ships having lifting appliances are initially certified by a competent person, and to establish periodically that they continue to be in safe working order to the satisfaction of a competent person acceptable to a competent authority. A Register of lifting appliances and items of loose gear shall be kept in a form prescribed by the competent authority, account being taken of this model recommended by the International Labour Office. This Register and related certificates shall be kept available to

any person authorized by the competent authority. The Register and certificates for gear currently aboard the ship shall be preserved for at least five years after the date of the last entry.

INSTRUCTION

1. Initial Examination and Certification

1.1. Every lifting appliance shall be certified by a competent person before being taken into use for the first time to ensure that it is of good design and construction and of adequate strength for the purpose for which it is intended.

1.2. Before being taken into use for the first time, a competent person shall supervise and witness testing, and shall thoroughly examine every lifting appliance.

1.3. Every item of loose gear shall, before being taken into use for the first time, shall be tested, thoroughly examined and certified by a competent person, in accordance with national law or regulations.

1.4. Upon satisfactory completion of the procedures indicated above, the competent person shall complete and issue the Register of lifting appliances and attach the appropriate certificates. An entry shall be made in part I of the Register.

1.5. A rigging plan showing the arrangement of lifting appliances shall be provided. In the case of derricks and derrick cranes, the rigging should show at least the following information:

- (a) The position of guys;
- (b) The resultant force on blocks, guys, wire ropes and booms;
- (c) The position of blocks;
- (d) The identification mark of individual items; and
- (e) Arrangements and working range of union purchase.

2. Periodic Examination and Re-testing

2.1. All lifting appliances and every item of loose gear shall be thoroughly examined by a competent person at least once in every twelve months. The particulars of these thorough examinations shall be entered in part I of the Register.

2.2. Re-testing and thorough examination of all lifting appliances and every item of loose gear is to be carried out:

- (a) after any substantial alteration or renewal, or after repair to any stress bearing part, and
- (b) in the case of lifting appliances, at least once in every five years.

2.3. The retesting referred to in paragraph 2.2(a) may be omitted provided the part which has been renewed or repaired is subjected by separate test, to the same stress as would be imposed on it if it had been tested in-situ during the testing of the lifting appliance.

2.4. The thorough examinations and tests referred to in paragraph 2.2. are to be entered in part I of the Register.

2.5. No new item of loose gear shall be manufactured of wrought iron. Heat treatment of any existing wrought iron components should be carried out to the satisfaction of the competent person. No heat treatment should be applied to any item of loose gear unless the treatment is in accordance with the manufacturer's instruction; and to the satisfaction of the competent person. Any heat treatment and the associated examination are to be recorded by the competent person in part I of the Register.

3. Inspections

3.1. Regular visual inspections of every item of loose gear shall be carried out by a responsible person before use. A record of these regular inspections is to be entered in part II of the Register, but entries need only be made when the inspection has indicated a defect in the item.

4. Certificates

4.1. The certification forms to be used in conjunction with this Register (Form No. 1) are as follows:

(Form No. 2)—Certificate of test and thorough examination of lifting appliance.

(Form No. 2(U))—Certificate of test and thorough examination of derricks used in union purchase.

(Form No. 3)—Certificate of test and thorough examination of loose gear.

(Form No. 4)—Certificate of test and thorough examination of wire rope.

DEFINITIONS

(a) The term "competent authority" means a minister, government department, or other authority empowered to issue regulations, orders or other instructions having the force of law.

(b) The term "competent person" means a person appointed by the master of the ship or the owner of the gear to be responsible for the performance of inspections and who has sufficient knowledge and experience to undertake such inspections.

(c) The term "thorough examination" means a detailed visual examination by a competent person, supplemented if necessary by other suitable means or measures in order to arrive at a reliable conclusion as to the safety of the lifting appliance or item of loose gear examined.

(d) The term "lifting appliance" covers all stationary or mobile cargo handling appliances used on board ship for suspending, raising or lowering loads or moving them from one position to another while suspended or supported.

(e) The term "loose gear" covers any gear by means of which a load can be attached to

a lifting appliance, but which does not form an integral part of the appliance or load.

THE FOLLOWING ARE SAMPLE FORMS OF CERTIFICATES AS RECOMMENDED BY THE ILO

[Part I—Thorough Examination of Lifting Appliances and Loose Gear]

Situation and description of lifting appliances and loose gear (with distinguishing numbers or marks, if any) which have been thoroughly examined. (See note 1)	Certificate Nos.	Examination performed (see note 2)	I certify that on the date to which I have appended my signature, the gear shown in col. (1) was thoroughly examined and no defects affecting its safe working condition were found other than those shown in col. (5) (date and signature)	Remarks (to be dated and signed)
(1)	(2)	(3)	(4)	(5)
	
	
	

NOTE 1: If all the lifting appliances are thoroughly examined on the same date it will be sufficient to enter in Col. (1) "All lifting appliances and loose gear". If not, the parts that have been thoroughly examined on the dates stated must be clearly indicated.

NOTE 2: The thorough examinations to be indicated in Col. (3) include:

- (a) Initial.
- (b) 12 monthly.
- (c) 5 yearly.
- (d) Repair/Damage.
- (e) Other thorough examinations.

[Part II—Regular Inspections of Loose Gear]

Situation and description of loose gear (with distinguishing numbers or marks, if any) that has been inspected. (See note 1)	Signature and date of the responsible person carrying out the inspection	Remarks (to be dated and signed)

NOTE 1: All loose gear should be inspected before use. However, entries need only be made when the inspection discloses a defect.

Form No. 2

Official Number _____

Identity of National Authority or Competent Organization Certificate of Test and Thorough Examination of Lifting Appliances

Call Sign _____

Port of Registry _____

Name of Owner _____

Name of Ship _____

Certificate No. _____

Situation and description of lifting appliances (with distinguishing numbers or marks, if any) which have been tested and thoroughly examined	Angle to the horizontal or radius at which test load applied	Test load (tonnes)	Safe working load at angle or radius shown in col. 2 (tonnes)
(1)	(2)	(3)	(4)

Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that on the date to which I have appended my signature, the gear shown in Col. (1) was tested and thoroughly examined

and no defects or permanent deformation was found and that the safe working load is as shown.

Date: _____

Place: _____

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Signature: _____

NOTE: This certificate is the standard international form as recommended by the International Labor Office in accordance with ILO Convention No. 152.

Reverse of Form No. 2

INSTRUCTIONS

1. Every lifting appliance shall be tested with a test load which shall exceed the Safe Working Load (SWL) as follows:

SWL	Test load
Up to 20 tonnes	25 percent in excess.
20 to 50 tonnes	5 tonnes in excess.
Over 50 tonnes	10 percent in excess.

2. In the case of derrick systems, the test load shall be lifted with the ship's normal tackle with the derrick at the minimum angle to the horizontal for which the derrick system was designed (generally 15 degrees), or at such greater angle as may be agreed. The angle at which the test was made should be stated in the certificate.

2.1. The SWL shown is applicable to swinging derrick systems only. When derricks are used in union purchase, the SWL (U) is to be shown on Form 2 (U).

2.2. In the case of heavy derricks, care should be taken to ensure that the appropriate stays are correctly rigged.

3. In the case of cranes, the test load is to be hoisted and luffed at slow speed. Gantry and traveling cranes together with their trolleys, where appropriate, are to be traversed and traveled over the full length of their track.

3.1. In the case of variable load-radius cranes, the tests are generally to be carried out with the appropriate test load at maximum, minimum and intermediate radii.

3.2. In the case of hydraulic cranes where limitations of pressure make it impossible to lift a test load 25 percent in excess of the safe working load, it will be sufficient to lift the greatest possible load, but in general this should not be less than 10 percent in excess of the safe working load.

4. As a general rule, tests should be carried out using test loads, and no exception should be allowed in the case of initial tests. In the case of repairs/replacement or when the periodic examination calls for re-test, consideration may be given to the use of spring or hydraulic balances provided the SWL of the lifting appliance does not exceed 15 tonnes. Where a spring or hydraulic balance is used, it shall be calibrated and accurate to within #2 percent and the indicator should remain constant for five minutes.

4.1. If the test weights are not used, this is to be indicated in Col. (3).

5. The expression "tonne" shall mean a tonne of 1000 kg.

6. The terms "competent person", "thorough examination", and "lifting appliance" are defined in Form No. 1.

NOTE: For recommendations on test procedures reference may be made to the ILO document "Safety and Health in Dock Work".

Form No. 2(U)

IDENTITY OF NATIONAL AUTHORITY OR COMPETENT ORGANIZATION CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF DERRICKS USED IN UNION PURCHASE

Name of Ship _____
 Official Number _____
 Call Sign _____
 Port of Registry _____
 Name of Owner _____
 Certificate No. _____

Situation and description of derricks used in Union Purchase (with distinguishing numbers or marks) which have been tested and thoroughly examined	Max. height of triangle plate above hatch coaming (m) or max. angle between runners	Test load (tonnes)	Safe working load, SWL when operating in union purchase (tonnes)
(1)	(2)	(3)	(4)

Position of outboard preventer guy attachments:

- (a) forward/aft * of mast—(m) and
 (b) from ship's centerline—(m)

Position of inboard preventer guy attachments:

- (a) forward/aft * of mast—(m) and
 (b) from ship's centerline—(m)

*Delete as appropriate.

Name and address of the firm or competent person who witnessed testing and carried out thorough examination

I certify that on the date to which I have appended my signature, the gear shown in Col. (1) was tested and thoroughly examined

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and no defects or permanent deformation was found and that the safe working load is as shown.

Date: _____
Signature: _____
Place: _____

NOTE: This certificate is the standard international form as recommended by the International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 2 (U)

INSTRUCTIONS

1. Before being taken into use, the derricks rigged in Union Purchase shall be tested with a test load which shall exceed the Safe Working Load (SWL (U)) as follows:

SWL	Test load
Up to 20 tonnes	25 percent in excess.
20 to 50 tonnes	5 tonnes in excess.
Over 50 tonnes	10 percent in excess.

2. Tests are to be carried out at the approved maximum height of the triangle plate above the hatch coaming or at the angle between the cargo runners and with the der-

Distinguishing number or mark	Description of loose gear	Number tested	Date of test	Test load (tonnes)	Safe work load (SWL) (tonnes)

Name and address of makers or suppliers:
Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that the above items of loose gear were tested and thoroughly examined and no defects affecting their SWL were found.

Date: _____
Place: _____
Signature: _____

NOTE: This certificate is the standard international form as recommended by the

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rick booms in their working positions, to prove the strength of deck eye plates and the Union Purchase system. These heights or angles must not exceed the values shown on the rigging plan.

3. Tests should be carried out using test loads.

4. The expression "tonne" shall mean a tonne of 1000 kg.

5. The terms "competent person", "thorough examination" and "lifting appliance" are defined in Form No. 1.

NOTE: For recommendations on test procedures, reference may be made to the ILO document "Safety and Health in Dock Work".

Form 3

IDENTITY OF NATIONAL AUTHORITY OR COMPETENT ORGANIZATION CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF LOOSE GEAR

Name of Ship _____
Official Number _____
Call Sign _____
Port of Registry _____
Name of Owner _____
Certificate No. _____

International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 3

INSTRUCTIONS

1. Every item of loose gear is to be tested and thoroughly examined before being put into use for the first time and after any substantial alteration or repair to any part liable to affect its safety. The test loads to be applied shall be in accordance with the following table:

Item	Test load (tonnes)
Single sheave blocks (See Note 1)	4 × SWL
Multi sheave blocks (See Note 2):	
SWL < 25 tonnes	2 × SWL
25 tonnes < SWL ≤ 160 tonnes	(0.933 × SWL) + 27
SWL > 160 tonnes	1.1 × SWL
Chains, hooks, rings, shackles, swivels, etc.:	
SWL < 25 tonnes	2 × SWL
SWL > 25 tonnes	(1.22 × SWL) + 20
Lifting beams, spreaders, frames and similar devices:	
SWL ≤ 10 tonnes	2 × SWL
10 tonnes < SWL ≤ 160 tonnes	(1.04 × SWL) + 9.6

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Item	Test load (tonnes)
SWL > 160 tonnes	1.1 × SWL

NOTE: 1. The SWL for a single sheave block, including single sheave blocks with becketts, is to be taken as one-half of the resultant load on the head fitting.

2. The SWL of a multi-sheave block is to be taken as the resultant load on the head fitting.

3. This form may also be used for the certification of interchangeable components of lifting appliances.

4. The expression “ton” shall mean a ton of 1,000 kg.

5. The terms “competent person”, “thorough examination” and “loose gear” are defined in Form No. 1.

NOTE: For recommendations on test procedures reference may be made to the ILO document “Safety and Health in Dock Work”.

Form No. 4

IDENTITY OF NATIONAL AUTHORITY OR COMPETENT ORGANIZATION CERTIFICATE OF TEST AND THOROUGH EXAMINATION OF WIRE ROPE

Name of Ship

Official Number

Call Sign

Port of Registry

Name of Owner

Certificate No.

Name and address of maker or supplier	
Nominal diameter of rope (mm) Number of strands Number of wires per strand Core Lay Quality of wire (N/mm ²) Date of test of sample Load at which sample broke (tonnes) Safe working load of rope (tonnes) Intended use	

Name and address of the firm or competent person who witnessed testing and carried out thorough examination.

I certify that the above particulars are correct, and that the rope was tested and thoroughly examined and no defects affecting its SWL were found.

Date:

Place:

Signature:

NOTE: This certificate is the standard international form as recommended by the

International Labour Office in accordance with ILO Convention No. 152.

Reverse Form No. 4

INSTRUCTIONS

1. Wire rope shall be tested by sample, a piece being tested to destruction.

2. The test procedure should be in accordance with an International or recognized National standard.

3. The SWL of the rope is to be determined by dividing the load at which the sample broke, by a co-efficient of utilization, determined as follows:

Item	Coefficient
Wire rope forming part of a sling:	
SWL of the sling	5
SWL < 10 tonnes	10 ⁵
10 tonnes < SWL ≤ 160 tonnes	(8.85 × SWL) + 1910
SWL > 160 tonnes	3
Wire rope as integral part of a lifting appliance:	
SWL of lifting appliance	10 ⁴
SWL ≤ 160 tonnes	(8.85 × SWL) + 1910
SWL > 160 tonnes	3

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These coefficients should be adopted unless other requirements are specified by a National Authority.

4. The expression “tonne” shall mean a tonne of 1000 kg.

5. The terms “competent person”, “thorough examination” and “lifting appliance” are defined in Form No. 1.

NOTE: For recommendations on test procedures reference may be made to the ILO document “Safety and Health in Dock Work”.

APPENDIX II TO PART 1918—TABLES FOR SELECTED MISCELLANEOUS AUXILIARY GEAR (MANDATORY)

NOTE: This appendix is mandatory and is to be used in the appropriate sections of part 1918 when certificates or the manufacturers’ use recommendations are not available.

TABLE 1—WIRE ROPE CLIPS

Improved plow steel, rope (Inches (cm))	Minimum number of clips		Minimum spacing (Inches (cm))
	Drop forged	Other material	
1/2 or less (1.3)	3	4	3 (7.6)
5/8 (1.6)	3	4	3 3/4 (9.5)
3/4 (1.9)	4	5	4 1/2 (11.4)
7/8 (2.2)	4	5	5 1/4 (13.3)
1 (2.5)	5	6	6 (15.2)
1 1/8 (2.9)	6	6	6 3/4 (17.1)
1 1/4 (3.2)	6	7	7 1/2 (19.1)
1 3/8 (3.5)	7	7	8 1/4 (21.0)
1 1/2 (3.8)	7	8	9 (22.9)

TABLE 2—NATURAL FIBER ROPE AND ROPE SLINGS—LOAD CAPACITY IN POUNDS (LBS.) SAFETY FACTOR=5—EYE AND EYE SLING—BASKET HITCH

[Angle of rope to horizontal—90 deg. 60 deg. 45 deg. 30 deg.]

Rope diameter nominal inch	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
1/2	550	250	1,100	900	750	550
9/16	700	350	1,400	1,200	1,000	700
5/8	900	450	1,800	1,500	1,200	900
3/4	1,100	550	2,200	1,900	1,500	1,100
13/16	1,300	650	2,600	2,300	1,800	1,300
7/8	1,500	750	3,100	2,700	2,200	1,500
1	1,800	900	3,600	3,100	2,600	1,800
1 1/16	2,100	1,100	4,200	3,600	3,000	2,100
1 1/8	2,400	1,200	4,800	4,200	3,400	2,400
1 1/4	2,700	1,400	5,400	4,700	3,800	2,700
1 5/16	3,000	1,500	6,000	5,200	4,300	3,000
1 1/2	3,700	1,850	7,400	6,400	5,200	3,700
1 5/8	4,500	2,300	9,000	7,800	6,400	4,500
1 3/4	5,300	2,700	10,500	9,200	7,500	5,300
2	6,200	3,100	12,500	10,500	8,800	6,200
2 1/8	7,200	3,600	14,500	12,500	10,000	7,200
2 1/4	8,200	4,100	16,500	14,000	11,500	8,200
2 1/2	9,300	4,700	18,500	16,000	13,000	9,300
2 5/8	10,500	5,200	21,000	18,000	14,500	10,500

Endless Sling

1/2	950	500	1,900	1,700	1,400	950
9/16	1,200	600	2,500	2,200	1,800	1,200
5/8	1,600	800	3,200	2,700	2,200	1,600
3/4	2,000	950	3,900	3,400	2,800	2,000
13/16	2,300	1,200	4,700	4,100	3,300	2,300
7/8	2,800	1,400	5,600	4,800	3,900	2,800
1	3,200	1,600	6,500	5,600	4,600	3,200
1 1/16	3,800	1,900	7,600	6,600	5,400	3,800
1 1/8	4,300	2,200	8,600	7,500	6,100	4,300
1 1/4	4,900	2,400	9,700	8,400	6,900	4,900
1 5/16	5,400	2,700	11,000	9,400	7,700	5,400
1 1/2	6,700	3,300	13,500	11,500	9,400	6,700

TABLE 2—NATURAL FIBER ROPE AND ROPE SLINGS—LOAD CAPACITY IN POUNDS (LBS.) SAFETY
FACTOR=5—EYE AND EYE SLING—BASKET HITCH—Continued

[Angle of rope to horizontal—90 deg. 60 deg. 45 deg. 30 deg.]

Rope diameter nominal inch	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
1 ⁵ / ₈	8,100	4,100	16,000	14,000	11,500	8,100
1 ³ / ₄	9,500	4,800	19,000	16,500	13,500	9,500
2	11,000	5,600	22,500	19,500	16,000	11,000
2 ¹ / ₈	13,000	6,500	26,000	22,500	18,500	13,000
2 ¹ / ₄	15,000	7,400	29,500	25,500	21,000	15,000
2 ¹ / ₂	16,500	8,400	33,500	29,000	23,500	16,500
2 ⁵ / ₈	18,500	9,500	37,000	32,500	26,500	18,500

TABLE 3A

Polypropylene Rope and Rope Slings

Load Capacity in Pounds (lbs.) Safety Factor=6

Eye and Eye Sling

Basket Hitch

Angle of rope to horizontal

Rope diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
1/2	650	350	1,300	1,200	950	650
9/16	800	400	1,600	1,400	1,100	800
5/8	1,000	500	2,000	1,700	1,400	1,000
3/4	1,300	700	2,700	2,300	1,900	1,300
13/16	1,600	800	2,600	2,300	2,200	1,600
7/8	1,800	900	3,100	2,700	2,600	1,800
1	2,200	1,100	3,600	3,100	3,100	2,200
1 1/16	2,500	1,300	4,200	3,600	3,600	2,500
1 1/8	2,900	1,500	4,800	4,200	4,100	2,900
1 1/4	3,300	1,700	6,700	5,800	4,700	3,300
1 5/16	3,700	1,900	7,400	6,400	5,300	3,700
1 1/2	4,700	2,400	9,400	8,100	6,700	4,700
1 5/8	5,700	2,900	11,500	9,900	8,100	5,700
1 3/4	6,800	3,400	13,500	12,000	9,600	6,800
2	8,200	4,100	16,500	14,500	11,500	8,200
2 1/8	9,700	4,800	19,500	16,500	13,500	9,700
2 1/4	11,000	5,500	22,000	19,000	15,500	11,000
2 1/2	12,500	6,300	25,500	22,000	18,000	12,500
2 5/8	14,500	7,100	28,500	24,500	20,000	14,500

TABLE 3B

Polypropylene Rope and Rope Slings

Load Capacity in Pounds (lbs.) Safety Factor = 6

Endless Sling

Basket Hitch

Angle of rope to horizontal

90 deg. 60 deg. 45 deg. 30 deg.

Rope diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
1/2	1,200	600	2,400	2,100	1,700	1,200

Rope diameter nominal in.	Vertical hitch	Choker hitch	Angle of rope to vertical			
			0 deg.	30 deg.	45 deg.	60 deg.
9/16	1,500	750	2,900	2,500	2,100	1,500
5/8	1,800	900	3,500	3,100	2,500	1,800
3/4	2,400	1,200	4,900	4,200	3,400	2,400
13/16	2,800	1,400	5,600	4,900	4,000	2,800
7/8	3,300	1,600	6,600	5,700	4,600	3,300
1	4,000	2,000	8,000	6,900	5,600	4,000
1 1/16	4,600	2,300	9,100	7,900	6,500	4,600
1 1/8	5,200	2,600	10,500	9,000	7,400	5,200
1 1/4	6,000	3,000	12,000	10,500	8,500	6,000
1 5/16	6,700	3,400	13,500	11,500	9,500	6,700
1 1/2	8,500	4,200	17,000	14,500	12,000	8,500
1 5/8	10,500	5,100	20,500	18,000	14,500	10,500
1 3/4	12,500	6,100	24,500	21,000	17,500	12,500
2	15,000	7,400	29,500	25,500	21,000	15,000
2 1/8	17,500	8,700	35,500	30,100	24,500	17,500
2 1/4	19,500	9,900	39,500	34,000	28,000	19,500
2 1/2	23,000	11,500	45,500	39,500	32,500	23,000
2 5/8	25,500	13,000	51,500	44,500	36,500	25,500

TABLE 4A—RATED LOAD FOR GRADE 80 ALLOY STEEL CHAIN SLINGS¹ (CHAIN PER NACM)

Chain size nominal		Single leg sling-90 deg. to horizontal loading		Rated load double leg sling horizontal angle (note 2)					
				60 deg. Double at 60 deg.		45 deg. Double at 45 deg.		30 deg. Double at 30 deg.	
inch	mm	lb	kg	lb	kg	lb	kg	lb	kg
1/4	7	3,500	1,570	6,100	2,700	4,900	2,200	3,500	1,590
3/8	10	7,100	3,200	12,300	5,500	10,000	4,500	7,100	3,200
1/2	13	12,000	5,400	20,800	9,400	17,000	7,600	1,200	5,400
5/8	16	18,100	8,200	31,300	14,200	25,600	11,600	18,100	8,200
3/4	20	28,300	12,800	49,000	22,300	40,000	18,200	28,300	12,900
7/8	22	34,200	15,500	59,200	27,200	48,400	22,200	34,200	15,700
1	26	47,700	21,600	82,600	37,900	67,400	31,000	47,700	21,900
1 1/4	32	72,300	32,800	125,200	56,800	102,200	46,400	72,300	32,800

NOTES:

(1) Other grades of proof tested steel chain include Proof Coil (Grade 28), Hi-Test (grade 43 Chain, and Transport (grade 70) Chain. These grades are not recommended for overhead lifting and therefore are not covered by this standard.

(2) Rating of multi-leg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load.

TABLE 4B—MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Nominal chain or coupling link size		Maximum allowable wear of cross-sectional diameter, in.
inch	mm	
1/4	7	0.037
3/8	10	0.052
1/2	13	0.060
5/8	16	0.084
3/4	20	0.105
7/8	22	0.116
1	26	0.137
1 1/4	32	0.169

NOTE: For other sizes, consult chain or sling manufacturer.

TABLE 5—SAFE WORKING LOADS FOR SHACKLES

[In tons of 2,000 pounds]

Material size		Pin diameter		Safe working load in 2,000 lb tons
Inches	(cm)	Inches	(cm)	
1/2	(1.3)	5/8	(1.6)	1.4
5/8	(1.6)	3/4	(1.9)	2.2
3/4	(1.9)	7/8	(2.2)	3.2
7/8	(2.2)	1	(2.5)	4.3
1	(2.5)	1 1/8	(2.9)	5.6
1 1/8	(2.9)	1 1/4	(3.2)	6.7

TABLE 5—SAFE WORKING LOADS FOR SHACKLES—Continued
[In tons of 2,000 pounds]

Material size		Pin diameter		Safe working load in 2,000 lb tons
Inches	(cm)	Inches	(cm)	
1¼	(3.2)	1⅝	(3.5)	8.2
1⅜	(3.5)	1½	(3.8)	10.0
1½	(3.8)	1⅞	(4.1)	11.9
1¾	(4.4)	2	(5.1)	16.2
2	(5.1)	2¼	(5.7)	21.2

WIRE ROPE TABLE—RATE LOADS FOR SINGLE LEG SLINGS 6×19 OR 6×37 CLASSIFICATION
IMPROVED PLOW STEEL GRADE ROPE WITH FIBER CORE (FC)
[Rated loads [note 1], tons (2,000 lb)]

Vertical				Choker
Rope diameter, inch	HT	MS	S	HT, MS&S
¼	0.49	0.51	0.55	0.38
5/16	0.78	0.79	0.85	0.6
3/8	1.1	1.1	1.2	0.85
7/16	1.4	1.5	1.7	1.2
½	1.8	2.0	2.1	1.5
9/16	2.3	2.5	2.7	1.9
5/8	2.8	3.1	3.3	2.3
¾	3.9	4.4	4.8	3.3
7/8	5.2	6.0	6.4	4.5
1	6.7	7.7	4.8	5.9
1⅛	8.4	9.5	11	7.4
1¼	10	12	13	9.0
1⅜	12	14	15	11
1½	15	17	18	13
1⅞	17	19	21	15
1¾	20	22	25	17
2	26	29	32	22

HT=Hand Tucked Splice.

For Hidden Tuck Splice (IWRC), use values in HT (FC) columns.

MS=Mechanical Splice.

S=Pourd Socket or Swaged Socket.

NOTE: (1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

WIRE ROPE TABLE—RATED LOADS FOR SINGLE LEG SLINGS 6×19 OR 6×37 CLASSIFICATION EXTRA
IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)
[Rated loads [note 1], tons (2,000 lb)]

Vertical				Choker	Vertical basket	
Rope diameter, inch	HT	MS	S	HT, MS&S	[Note (2)] HT	[Note (3)] MS&S
¼	0.53	0.59	0.59	0.31	1.1	1.1
5/16	0.82	0.87	0.92	0.64	1.6	1.7
3/8	1.2	1.2	1.3	0.92	2.3	2.5
7/16	1.5	1.7	1.8	1.2	3.1	3.4
½	2.0	2.2	2.3	1.6	4.0	4.4
9/16	2.5	2.8	2.9	2.0	1.9	5.5
5/8	3.0	3.4	3.6	2.6	6.0	6.8
¾	4.2	4.9	5.1	3.6	8.4	9.7
7/8	5.5	6.6	6.9	4.8	11	13
1	7.2	8.5	9.0	6.3	14	17
1⅛	9.0	10	11	7.9	18	20
1¼	11	13	14	9.7	22	26
1⅜	13	15	17	12	27	31
1½	16	18	20	14	32	37
1⅞	18	21	23	16	37	43
1¾	21	25	27	19	43	49
2	28	32	34	24	55	64

HT=Hand tucked Splice

For Hidden Tuck Splice (IWRC), use values in HT columns of Table 3.

MS=Mechanical Splice. S=Pourd Socket or Swaged Socket.

NOTES:

(1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

(2) These values only apply when the D/d ratio is 15 or greater.

(3) These values only apply when the D/d ratio is 25 or greater.

D=Diameter or curvature around which the body of the sling is bent. d=Diameter of rope.

**WIRE ROPE TABLE-RATED LOADS FOR SINGLE LEG SLINGS 6×19 OR 6×37 CLASSIFICATION EXTRA
IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)**

[Rated loads [note 1], tons (2,000 lb)]

Vertical Rope diameter			Choker	Vertical basket [note (2)]
	MS	S	MS&S	MS&S
1/4	0.65	0.68	0.48	1.3
5/16	1.0	1.1	.074	2.0
3/8	1.4	1.5	1.1	2.9
7/16	1.9	2.0	1.4	3.9
1/2	2.5	2.7	1.9	5.1
9/16	3.2	3.4	2.4	6.4
5/8	3.9	4.1	2.9	7.8
3/4	5.6	5.9	4.1	11
7/8	7.6	8.0	5.6	15
1	9.8	10	7.2	20
1 1/8	12	13	9.1	24
1 1/4	15	16	11	30
1 3/8	18	19	13	36
1 1/2	21	23	16	42
1 5/8	24	26	18	49
1 3/4	28	31	21	57
2	37	40	28	73

HT=Hand tucked Splice

For Hidden Tuck Splice (IWRC), use values in HT columns of Table 3.

MS=Mechanical Splice.

S=Pour Socket or Swaged Socket.

NOTE: (1) These values are based on slings being vertical. If they are not vertical, the rated load shall be reduced. If they are not vertical, the rated load shall be reduced. If two or more slings are used, the minimum horizontal angle between the slings shall also be considered.

(2) These values only apply when the D/d ratio is 25 or greater.

[62 FR 40202, July 25, 1997, as amended at 65 FR 40947, June 30, 2000]

APPENDIX III TO PART 1918—THE MECHANICS OF CONVENTIONAL CARGO GEAR (NON-MANDATORY)

NOTE: This appendix is non-mandatory and provides an explanation of the mechanics in the correct spotting of cargo handling gear.

Although the most prevalent method of cargo handling is accomplished through the use of modern shoreside container gantry cranes, there are occasions when break-bulk cargo is handled with conventional ship's cargo gear. This appendix provides a reference for those unfamiliar with such cargo gear.

Sections 1918.52, 1918.53, and 1918.54 all address the subject of rigging and operating vessel's cargo handling gear. It is important to understand that under the Burton System of cargo handling (conventional gear consisting of two cargo derricks with married falls), the midships or up-and-down boom should be spotted as close to the fore and aft centerline of the hatch as operationally possible. Such spotting of the up-and-down

boom will allow the most effective leads for the guy(s) and preventer(s) to safely support the lateral stresses generated in the boom(s) by the married falls. As the lead of the guy(s) and preventer(s) approaches the vertical, in supporting the boom(s) head, the total stress in the guy(s) increases rapidly due to the increased vertical force that is generated in the guy(s) in order to counteract any particular horizontal or lateral force exerted on the boom(s) head. The appreciable vertical forces that are generated in this process are transmitted, in substantial part, to the boom(s) and topping lift(s), causing proportionate compressive stresses in the boom(s) and tension stresses in the topping lift(s).

In general, guys and preventers must be located so that enough vertical resistance is developed so as to prohibit the boom(s) from jackknifing as cargo passes across the deck. Special care must be exercised in the proper placement of guys and preventers associated with the Burton or yard boom. Preventers,

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when used, must parallel as closely as possible the guys that they support. Guys and preventers must not be attached to the same fitting.

While under a load, the cargo falls (running rigging) must not be permitted to chafe on any standing or other running gear. Spe-

cial attention must be paid to ensure that cargo runners work freely through the heel block, without chafing the cheek of the block. Also, bobbing chains and heel block preventers must be attached so as to not interfere with the movement of the cargo runners.

APPENDIX IV TO PART 1918—SPECIAL CARGO GEAR AND CONTAINER SPREADER TEST REQUIREMENTS (MANDATORY) [SEE § 1918.61 (f), (g), (h)]

Type gear	Test requirement	Tested by	Proof test	
A. All Special Cargo Handling Gear Purchased or Manufactured on or After January 21, 1998				
1. Safe Working Load—greater than 5 short tons (10,000 lbs./4.5 metric tons).	Prior to initial use	OSHA accredited agency only.	Up to 20 short tons.	125% SWL.
	Prior to reuse after structural damage repair. Every four years after initial proof load test.	OSHA accredited agency or designated person.	From 20 to 50 short tons. Over 50 short tons	5 short tons in excess of SWL. 110% SWL.
2. Safe Working Load—5 short tons or less.	Prior to initial use	OSHA accredited agency or designated person.	125% SWL.	
3. Intermodal container spreaders not part of vessel's cargo handling gear.	Prior to reuse after structural damage repair. Prior to initial use	OSHA accredited agency only.	125% SWL.	
	Prior to reuse after structural damage repair. Every four years after initial proof load test.	OSHA accredited agency or designated person.		
B. All Special Cargo Handling Gear in Use Prior to January 21, 1998 and Proof Load Tested Prior to Initial Use (See Note Below)				
1. Safe Working Load—greater than 5 short tons (10,000 lbs./4540 kg.).	Every four years starting on January 21, 1998.	OSHA accredited agency or designated person.	Up to 20 short tons.	125% SWL.
	Prior to reuse after structural damage repair.	OSHA accredited agency	From 20 to 50 short tons. Over 50 short tons	5 short tons in excess of SWL. 110% SWL.
2. Safe Working Load—5 short tons or less.	Prior to reuse after structural damage repair.	OSHA accredited agency or designated person.	125% SWL.	
3. Intermodal container spreaders not part of vessel's cargo handling gear.	Every four years starting on January 21, 1998.	OSHA accredited agency or designated person.	125% SWL.	
	Prior to reuse after structural damage repair.	OSHA accredited agency.		

NOTE TO APPENDIX IV: Special stevedoring gear in use prior to January 21, 1998 was covered by § 1918.61(b), in effect prior to January 21, 1998. (See 29 CFR Parts 1911 to 1925 revised as of July 1, 1997). The assumption is made that gear in use prior to January 21, 1998, has already been proof load tested, although not necessarily by an accredited agency. However, if the employer cannot certify that such gear was proof load tested under § 1918.61(b), in effect prior to January 21, 1998, (See 29 CFR Parts 1911 to 1925 revised as of July 1, 1997), then it must be proof load tested in accordance with § 1918.61 in effect on

January 21, 1998, (See 29 CFR Parts 1911 to 1925 revised as of July 1, 1998.)

[65 FR 40950, June 30, 2000]

APPENDIX V TO PART 1918—BASIC ELEMENTS OF A FIRST AID TRAINING PROGRAM (NON-MANDATORY)

NOTE: This appendix is non-mandatory and provides guidelines for small businesses, institutions teaching first aid, and the recipients of first aid training.

GENERAL PROGRAM ELEMENTS

A. Teaching Methods

1. Trainees should develop “hands on” skills through the use of manikins and trainee partners during their training.
2. Trainees should be exposed to acute injury and illness settings as well as the appropriate response to those settings through the use of visual aids, such as video tape and slides.
3. Training should include a course workbook which discusses first aid principles and responses to settings that require interventions.
4. Training duration should allow enough time for particular emphasis on situations likely to be encountered in particular workplaces.
5. An emphasis on quick response to first aid situations should be incorporated throughout the program.

B. Principles of Responding to a Health Emergency

The training program should include instruction in:

1. Injury and acute illness as a health problem.
2. Interactions with the local emergency medical services system. Trainees have the responsibility for maintaining a current list of emergency telephone numbers (police, fire, ambulance, poison control) easily accessible to all employees.
3. The principles of triage.
4. The legal aspects of providing first aid services.

C. Methods of Surveying the Scene and the Victim(s)

The training program should include instruction in:

1. The assessment of scenes that require first aid services including:
 - a. general scene safety.
 - b. likely event sequence.
 - c. rapid estimate of the number of persons injured.
 - d. identification of others able to help at the scene.
2. Performing a primary survey of each victim including airway, breathing, and circulation assessments as well as the presence of any bleeding.
3. The techniques and principles of taking a victim’s history at the scene of an emergency.
4. Performing a secondary survey of the victim including assessments of vital signs, skin appearance, head and neck, eye, chest, abdomen, back, extremities, and medical alert symbols.

D. Basic Adult Cardiopulmonary Resuscitation (CPR)

Basic adult CPR training should be included in the program. Retesting should occur every year. The training program should include instruction in:

1. Establishing and maintaining adult airway patency.
2. Performing adult breathing resuscitation.
3. Performing adult circulatory resuscitation.
4. Performing choking assessments and appropriate first aid interventions.
5. Resuscitating the drowning victim.

E. Basic First Aid Intervention

Trainees should receive instruction in the principles and performance of:

1. Bandaging of the head, chest, shoulder, arm, leg, wrist, elbow, foot, ankle, fingers, toes, and knee.
2. Splinting of the arm, elbow, clavicle, fingers, hand, forearm, ribs, hip, femur, lower leg, ankle, knee, foot, and toes.
3. Moving and rescuing victims including one and two person lifts, ankle and shoulder pulls, and the blanket pull.

F. Universal Precautions

Trainees should be provided with adequate instruction on the need for and use of universal precautions. This should include:

1. The meaning of universal precautions, which body fluids are considered potentially infectious, and which are regarded as hazardous.
2. The value of universal precautions for infectious diseases such as AIDS and hepatitis B.
3. A copy of OSHA’s standard for occupational exposure to bloodborne pathogens or information on how to obtain a copy.
4. The necessity for keeping gloves and other protective equipment readily available and the appropriate use of them.
5. The appropriate tagging and disposal of any sharp item or instrument requiring special disposal measures such as blood soaked material.
6. The appropriate management of blood spills.

G. First Aid Supplies

The first aid provider should be responsible for the type, amount, and maintenance of first aid supplies needed for their particular worksite(s). These supplies need to be stored in a convenient area available for emergency access.

H. Trainee Assessments

Assessment of successful completion of the first aid training program should include instructor observation of acquired skills and

written performance assessments. First aid skills and knowledge should be reviewed every three years.

I. Program Update

The training program should be periodically reviewed with current first aid techniques and knowledge. Outdated material should be replaced or removed.

SPECIFIC PROGRAM ELEMENTS

A. Type of Injury Training

1. Shock

Instruction in the principles and first aid intervention in:

- a. shock due to injury.
- b. shock due to allergic reactions.
- c. the appropriate assessment and first aid treatment of a victim who has fainted.

2. Bleeding

a. the types of bleeding including arterial, venous, capillary, external, and internal.

b. the principles and performance of bleeding control interventions including direct pressure, pressure points, elevation, and pressure bandaging.

c. the assessment and approach to wounds including abrasions, incisions, lacerations, punctures, avulsions, amputations, and crush injuries.

d. the principles of wound care including infection precautions, wounds requiring medical attention, and the need for tetanus prophylaxis.

3. Poisoning

Instruction in the principles and first aid intervention of:

a. alkali, acid and systemic poisons. In addition, all trainees should know how and when to contact the local Poison Control Center.

b. inhaled poisons including carbon monoxide, carbon dioxide, smoke, and chemical fumes, vapors and gases as well as the importance of assessing the toxic potential of the environment to the rescuer and the need for respirators.

Trainees should be instructed in the acute effect of chemicals utilized in their plants, the location of chemical inventories, material safety data sheets (MSDS's), chemical emergency information, and antidote supplies.

c. topical poisons including poison ivy, poison sumac, poison oak, and insecticides.

d. drugs of abuse including alcohol, narcotics such as heroin and cocaine, tranquilizers, and amphetamines.

4. Burns

Instruction in the principles and first aid intervention of:

a. assessing the severity of the burn including first degree, second degree, and third degree burns.

b. differentiating between the types of third degree burns (thermal, electrical, and chemical) and their specific interventions. Particular attention should be focused upon chemical burns, and the use of specific chemicals in the workplace which may cause them.

5. Temperature Extremes

Instruction in the principles and first aid intervention of:

a. exposure to cold including frostbite and hypothermia.

b. exposure to heat including heat cramps, heat exhaustion, and heat stroke.

6. Musculoskeletal Injuries

The training program should include instruction in the principles and first aid intervention in:

a. open fractures, closed fractures, and splinting.

b. dislocations, especially the methods of joint dislocations of the upper extremity. The importance of differentiating dislocations from fractures.

c. joint sprains.

d. muscle strains, contusions, and cramps.

e. head, neck, back, and spinal injuries.

7. Bites and Stings

Instruction in the principles and first aid intervention in:

a. human and animal (especially dog and snake) bites.

b. bites and stings from insects (spiders, ticks, scorpions, hornets and wasps). Interventions should include responses to anaphylactic shock; other allergic manifestations; rabies and tetanus prophylaxis.

8. Medical Emergencies

Instruction in the principles and first aid intervention of:

a. heart attacks

b. strokes

c. asthma attacks

d. diabetic emergencies including diabetic coma, insulin shock, hyperglycemia, and hypoglycemia.

e. seizures including tonic-clonic and absence seizures. Importance of *not* putting gags in mouth.

f. pregnancy including the appropriate care of any abdominal injury or vaginal bleeding.

9. Confined Spaces

a. the danger of entering a confined space to administer first aid without having the appropriate respiratory protection.

b. if first aid personnel will be required to assist evacuations from confined spaces, additional training will be needed.

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B. Site of Injury Training

Instruction in the principles and first aid intervention of injuries to the following sites:

1. Head and Neck

a. including skull fractures, concussions, and mental status assessments with particular attention to temporary loss of consciousness and the need for referral to a physician.

b. including the appropriate approach to the management of the individual who has suffered a potential neck injury or fracture.

2. Eye

a. foreign bodies, corneal abrasions and lacerations.

b. chemical burns and the importance of flushing out the eye.

c. the importance of not applying antibiotics without physician supervision.

3. Nose

a. nose injuries and nose bleeds.

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4. Mouth and Teeth

a. oral injuries, lip and tongue injuries, and broken and removed teeth. The importance of preventing inhalation of blood and teeth.

5. Chest

a. rib fractures, flail chest, and penetrating wounds.

6. Abdomen

a. blunt injuries, penetrating injuries, and protruding organs.

7. Hand, Finger, and Foot Injuries

a. finger/toe nail hematoma, lacerations, splinters, finger nail avulsion, ring removal, and foreign bodies.

b. the importance of identifying amputation care hospitals in the area. When an amputation occurs, appropriate handling of amputated fingers, hands, and feet during the immediate transportation of the victim and body part to the hospital.